

*Serial No. 10/668,736
Amendment Under 37 C.F.R. 1.116
Reply to final Office Action of Jan. 25, 2005*

REMARKS

Applicants have canceled claims 1-18, amended claims 19 and 21 and added new claims 22-25. Claims 19-25 are pending. Reconsideration of this application, as amended, is requested.

Personal Interview

Applicants thank Examiner Marcheschi for the personal interview with Applicants' attorney Rick Franzen on March 14, 2005. As suggested in the interview, Applicants have submitted herewith a Declaration concerning the disclosure of the Hoopman '248 reference used in the art rejection. Additionally as suggested in the interview, Applicants have amended the claims to define separate sidewalls to overcome Hoopman '217.

The Claims, Generally

The presently claimed invention is directed to abrasive articles, in particular structured abrasive articles having abrasive features. The abrasive features have a body including a vertex, wherein the body is defined by four distinct sidewalls, each which is defined by a parabolic section. New claims are added herein, directed to methods of making an abrasive article having the recited abrasive features.

Section 102 Rejections

Claims 1, 5-7, and 11-18 were rejected under 35 USC § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over Hoopman et al. (U.S. Pat. No. 6,076,248) and also over Hoopman et al. (U.S. Pat. No. 5,681,217).

Each of claims 1, 5-7, and 11-18 has been canceled, rendering these rejections moot.

Section 103 Rejections

Claims 2-4, 8-10 and 19-21 were rejected under 35 USC § 103(a) as obvious over Hoopman et al. (U.S. Pat. No. 6,076,248) and also over Hoopman et al. (U.S. Pat. No. 5,681,217).

Each of claims 2-4 and 8-10 has been canceled, rendering these rejections moot.

Applicants respectfully disagree with these rejections in regard to claims 19-21.

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Hoopman '248 discloses structured abrasive articles where composites can have varying shapes and/or dimensions within the same abrasive article. Various shapes of composites are disclosed, such as cubic, prismatic (e.g., triangular, quadrilateral, hexagonal, etc.), conical, truncated conical, cylindrical, pyramidal, truncated pyramidal and the like. Examples 1 and 1A of the '248 patent have a composite topography of varying pyramids that have a rectangular base having a base width range of 0.016-0.018 inch (406-711 micrometers) with an average base width of 0.023 inch (584 micrometers), pyramid height of 0.014 inch (356 micrometers) and a linear pyramid edge profile. The Hoopman '248 patent does not disclose or suggest a feature or composite having distinct sidewalls that are defined by a parabolic section.

Submitted herewith is a Declaration of John D. Haas, one of the named inventors of this application. Mr. Haas attests that there is no structure disclosed in, or suggested by, Hoopman '248 that has a shape as recited by the pending claims, i.e., having a body that includes a vertex, and which is defined by four distinct sidewalls, each of the four distinct sidewalls being defined by a parabolic section.

An abrasive feature or composite having the parabolic side walls is desirable because the cross-section area of the feature or composite, taken parallel to the base of the feature, changes linearly as the distance from the base changes.

Hoopman '217 is directed to structured abrasive articles that are arranged so that an imaginary line drawn in a plane parallel to the base of the composites will intersect at least one composite. That is, there is no line in the abrasive composite array that will not intersect at least one composite. The '217 patent discloses various shapes of composites, such as frusto-conical (truncated cone-flat top), frusto-conical with a rounded, hemispherical or domed outer end, frusto-conical shape terminating at its outer end in a second small conical shape, cubic, prismatic (e.g., triangular, quadrilateral, hexagonal, etc.), conical, cylindrical, pyramidal, truncated pyramidal and the like. The body cross-section can be the shape of a circle, triangle, square, diamond, pentagon, hexagon, oval, octagon and other polygons. Figures 1, 2, 3 and 4 illustrate generally cylindrical, dome-like composites, with concave, convex, and flat tops.

The claims have been amended to specifically recite that the abrasive features of the pending invention have four discrete and distinct sidewalls. Applicants disagree that Hoopman

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'217 shows four sidewalls, much less four distinct sidewalls, as now claimed. As described in the specification of the presently pending application, on pages 20, line 26, through page 21, line 7, the sidewalls are distinct features with distinct boundaries, as is also seen in Figure 1. Note that Figure 1 shows a feature having sidewalls 131, 132, 133, and 134, which are distinct and separate from one another. In contrast, Figure 3 of Hoopman et al. '217 does not show an abrasive feature having four distinct sidewalls (i.e., there are no distinct boundaries). Reading Hoopman et al. in its totality, including from review of Figures 1, 2, 3, 4, and 10, it appears that the features disclosed have only a single sidewall. There is no suggestion of having four distinct sidewalls.

At least for these reasons, Applicants contend that the pending claims, as amended, are allowable over each of Hoopman '248 and Hoopman '217. Withdrawal of these rejections is requested.

Provisional Double Patenting

Claims 1-21 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 and 22-34 of co-pending Application No. 10/668,753.

Claims 1-18 have been canceled. Claims 19-21 and new claims 22-25 are pending. Applicants respectfully disagree with the double patenting rejection in respect to claims 19-25.

The pending claims of this application are directed to a specific abrasive feature having a body including a vertex, wherein the body is defined by four distinct sidewalls each which is defined by a parabolic section.

Claims 1-9 of the '753 application are directed to a structured abrasive article that has composites with a specific combination of large (i.e., at least 85 micrometer) ceramic abrasive particles in a large topography (i.e., at least 500 micrometers) that provides improved cut performance over at least 20 minutes. Claims 22-25 of the '753 application are directed to methods of making a structured abrasive article that has composites with a specific combination of large (i.e., at least 85 micrometer) ceramic abrasive particles in a large topography (i.e., at least 500 micrometers).

There is no suggestion in any of claims 1-9 and 22-34 of an abrasive feature, having four distinct sidewalls defined by parabolic sections, as recited by claims 19-25 of the present

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application (i.e., the '736 application). Likewise there is no suggestion in any of claims 19-25 of the present application (i.e., the '736 application) of abrasive composites with a specific combination of large (i.e., at least 85 micrometer) ceramic abrasive particles in a large topography (i.e., at least 500 micrometers), and methods of making those, as recited by claims 1-9 and 22-34 of the '753 application.

At least for these reasons, Applicants disagree with the provisional double patenting rejection, and request it be withdrawn.

Summary

In view of the above amendments and remarks, Applicants respectfully request a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone Applicant's attorney Rick L. Franzen, Reg. No. 51,702, at 651.736.6432.

Respectfully submitted,

Date:

Apr 120, 2005

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